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(54) Abstract Title

Inducing shear in a draught beverage

(57) Shear may be induced in a draught beverage by stirring with a stirring device 22 having a blade 23, shaking the vessel 2 into which the beverage is dispensed, or applying ultrasonic waves. The shaking means (5, fig. 1) may have a lid (8, fig.1) which at least partially covers the top of the vessel 2. Alternatively, the vessel 2 may be supported by a platform (31, fig.3) which oscillates about an axis perpendicular to the surface of the platform. The platform (31, fig.3) may alternatively be rotated about an axis which is not co-incident with the axis of the vessel. When being rotated on the support platform (51, fig.5), ultrasound may be applied to the beverage in the vessel 2. The introduction of shear into the beverage provides nucleation sites which encourage the formation of ice.

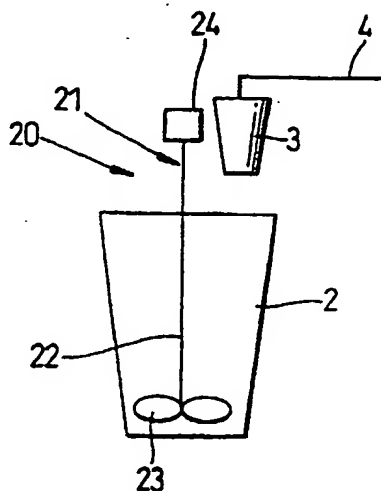


Fig. 2

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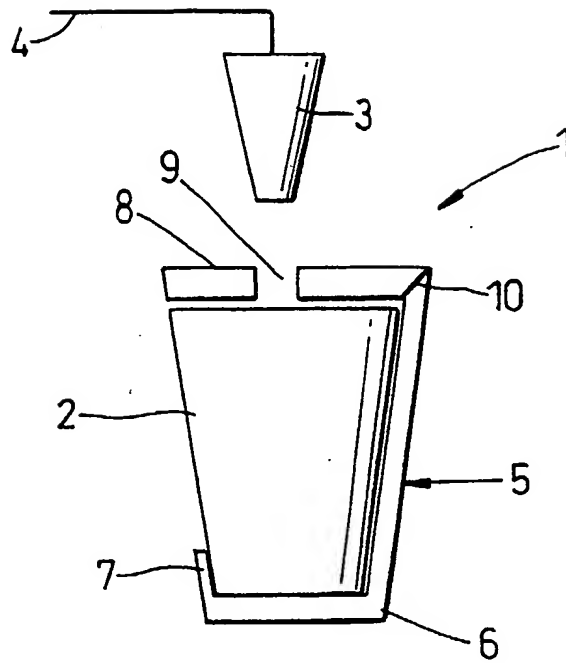


Fig. 1

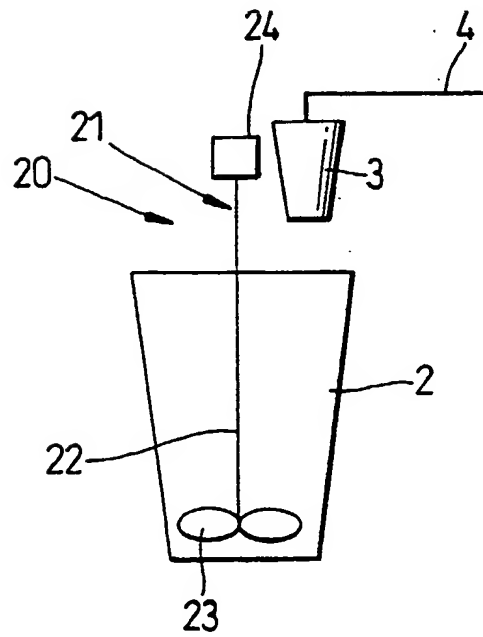


Fig. 2

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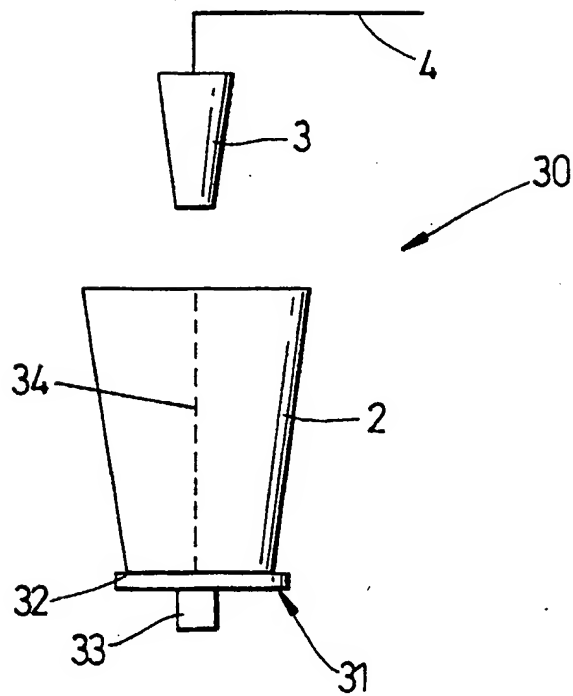


Fig. 3

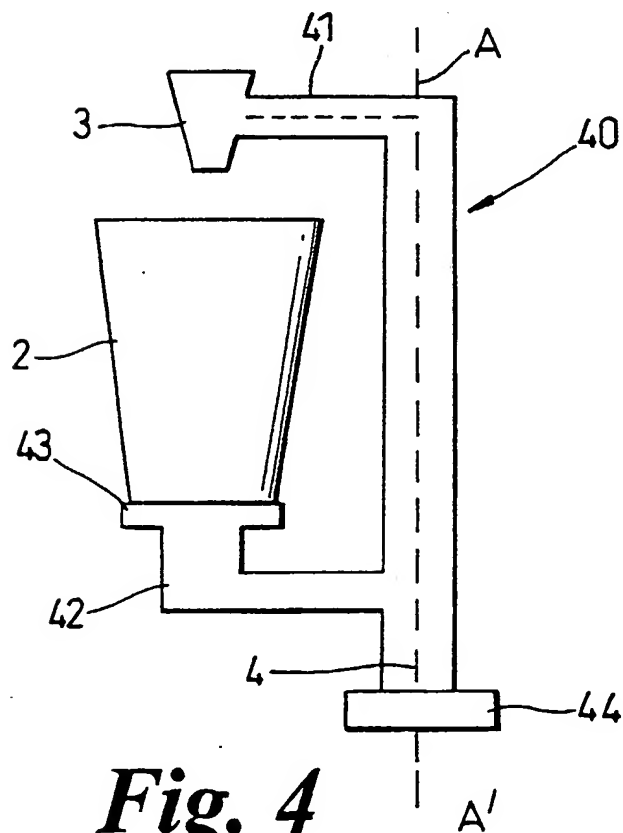


Fig. 4

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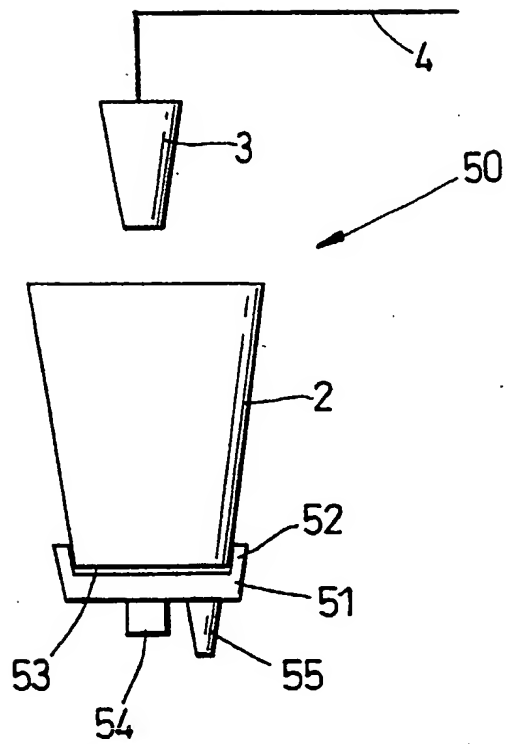


Fig. 5

DISPENSING A BEVERAGE

This invention concerns a method for dispensing a draught beverage, more particularly for dispensing a cooled draught beverage, apparatus for use in dispensing the beverage and the dispensed beverage.

According to a first aspect of the invention there is provided a method of dispensing a draught beverage which method comprises delivering a draught beverage into a vessel and inducing mechanical shear in the beverage in the vessel.

According to a second aspect of the invention there is further provided an apparatus for the delivery of a beverage to a vessel which apparatus comprises a nozzle for delivery of a beverage which nozzle is adapted to be connectable to a supply of the beverage, and a means for inducing mechanical shear in the beverage when it is present.

Mechanical shear is preferably induced in the beverage when it is being delivered into a vessel and/or after it has been delivered into the vessel.

The means for inducing mechanical shear in the beverage when it is present in the vessel may take any appropriate form. For example the means may comprise a stirring device. The stirring device may extend from the apparatus into the vessel. The stirring device is preferably provided with at least one blade or paddle.

Alternatively the means for inducing mechanical shear in the beverage may comprise a device for shaking the vessel. The device for shaking the vessel comprises an arm which is adapted to hold the vessel securely which arm is further adapted to be movable in such a manner as to induce mechanical shear in a beverage when the arm is holding a vessel

containing the beverage. The arm may optionally hold the base of the vessel or it may hold walls of the vessel. The device for shaking the vessel optionally further comprises a motor which is adapted to move the arm. The arm preferably further comprises lid means which at least
5 partially covers the top of the vessel such that when the device is operated, there is substantially no spillage of the beverage from the vessel. The lid means optionally defines a channel through which the beverage may pass from the nozzle into the vessel.

- 10 The means for inducing mechanical shear in the beverage is preferably electrically powered.

The vessel may be a drinking vessel, for example a glass.

- 15 The draught beverage may be cooled prior to delivering into the vessel, for example using beverage cooling means in a beverage dispensing system which may convey beverage from a supply of beverage to a dispense tap or a font at, for example, a drinks bar. The beverage may be non-alcoholic or alcoholic. For example, an alcoholic beverage may
20 be a beer, for example a lager or an ale, stout or porter or the alcoholic beverage may be cider. The beverage preferably has a dissolved gas content and/or a water content. The dissolved gas may be nitrogen and/or carbon dioxide.

- 25 One advantage of inducing mechanical shear in the beverage is that it is believed to promote the formation of ice in the beverage, especially when the beverage is cooled. The mechanical shear forces provide nucleation sites within the beverage which sites promote the formation of ice. They may also contribute to formation of a head on the beverage. The strength
30 and/or variation in the mechanical shear are preferably sufficient to promote the formation of nucleation sites within the beverage. The

nucleation sites may be formed by bubbles of gas which had been dissolved in the beverage.

5 According to a third aspect of the invention there is provided a method of dispensing a draught beverage which method comprises delivering a draught beverage into a vessel which vessel is supported by a platform wherein the platform oscillates about an axis perpendicular to the surface of the platform on which the vessel is resting.

10 According to a fourth aspect of the invention there is provided an apparatus for the delivery of a beverage to a vessel which apparatus comprises a nozzle for delivery of a beverage which nozzle is adapted to be connectable to a supply of the beverage, and a platform for supporting the vessel wherein the platform is provided with means which cause the
15 platform to oscillate about an axis perpendicular to the surface of the platform on which the vessel will rest.

The platform preferably oscillates when the beverage is being delivered into a vessel and/or after it has been delivered into the vessel.

20

The means which cause the platform to oscillate may take any form generally known in the art, for example a motor, especially an electric motor.

25 The vessel may be a drinking vessel, for example a glass.

The draught beverage may be cooled prior to delivering into the vessel, for example using beverage cooling means in a beverage dispensing system which may convey beverage from a supply of beverage to a
30 dispense tap or a font at, for example, a drinks bar. The beverage may be non-alcoholic or alcoholic. For example, an alcoholic beverage may

be a beer, for example a lager or an ale, stout or porter or the alcoholic beverage may be cider. The beverage preferably has a water content and/or a dissolved gas content. The dissolved gas may be nitrogen and/or carbon dioxide.

5

One advantage of having an oscillating platform is that it is believed to promote the formation of ice in the beverage, especially when the beverage is cooled. The mechanical shear forces produced in the beverage by the oscillating platform provide nucleation sites within the
10 beverage which sites promote the formation of ice. They may also contribute to formation of a head on the beverage. The rate of oscillation and/or the angle through which the platform oscillates (which may be for example from 5° to 720°) is/are preferably sufficient to promote the formation of nucleation sites within the beverage. The nucleation sites
15 may be formed by bubbles of gas which had been dissolved in the beverage.

According to a fifth aspect of the invention there is provided a method of dispensing a draught beverage which method comprises delivering a
20 draught beverage into a vessel which vessel is supported by a platform wherein the platform rotates about an axis perpendicular to the surface of the platform on which the vessel is resting which axis is not coincident with the centre of the vessel.

25 According to a sixth aspect of the invention there is provided an apparatus for the delivery of a beverage to a vessel which apparatus comprises a nozzle for delivery of a beverage which nozzle is adapted to be connectable to a supply of the beverage, and a platform for supporting the vessel wherein the platform is provided with means which cause the
30 platform to rotate about an axis perpendicular to the surface of the

platform on which the vessel will rest which axis is not coincident with the centre of the vessel.

5 The platform preferably rotates when the beverage is being delivered into a vessel and/or after it has been delivered into the vessel.

The means which cause the platform to rotate may take any form generally known in the art, for example a motor, especially an electric motor.

10

The nozzle is preferably also arranged to rotate about the same axis as the platform at the same rate as the platform. This is essential where the axis does not pass through a plan surface of the glass. Where the axis does pass through a plan surface of the glass and the nozzle is not arranged to rotate about the axis, the nozzle (preferably the centre of the nozzle) may be arranged to lie on the axis.

15

The vessel may be a drinking vessel, for example a glass.

20 The draught beverage may be cooled prior to delivering into the vessel, for example using beverage cooling means in a beverage dispensing system which may convey beverage from a supply of beverage to a dispense tap or a font at, for example, a drinks bar. The beverage may be non-alcoholic or alcoholic. For example, an alcoholic beverage may be a beer, for example a lager or an ale, stout or porter or the alcoholic beverage may be cider. The beverage preferably has a water content and/or a dissolved gas content. The dissolved gas may be nitrogen and/or carbon dioxide.

25

30 One advantage of rotating the platform is that it is believed to promote the formation of ice in the beverage, especially when the beverage is

cooled. The mechanical shear forces produced in the beverage by the rotating platform provide nucleation sites within the beverage which sites promote the formation of ice. They may also contribute to formation of a head on the beverage. The rate of rotation is preferably sufficient to
5 promote the formation of nucleation sites within the beverage. The nucleation sites may be formed by bubbles of gas which had been dissolved in the beverage.

The aforesaid rotation may be continuous or oscillatory. If desired, the
10 platform and/or vessel may also rotate or oscillate about another axis parallel to the first mentioned axis.

According to a seventh aspect of the invention there is provided a method of dispensing a draught beverage which method comprises delivering a
15 draught beverage into a vessel which vessel is supported by a platform wherein the platform rotates about an axis perpendicular to the surface of the platform on which the vessel is resting and wherein ultrasound is applied to the beverage.

20 According to an eighth aspect of the invention there is provided an apparatus for the delivery of a beverage to a vessel which apparatus comprises a nozzle for delivery of a beverage which nozzle is adapted to be connectable to a supply of the beverage, and a platform for supporting the vessel wherein the platform is provided with means which cause the
25 platform to rotate about an axis perpendicular to the surface of the platform on which the vessel will rest and wherein the apparatus further comprises an ultrasound generator to apply ultrasound to beverage in the vessel when supported by the platform.

30 The platform preferably rotates when the beverage is being delivered into a vessel and/or after it has been delivered into the vessel.

The ultrasound used generally has a frequency of above 20kHz. The ultrasound generator may take any suitable form generally known in the ultrasound art. The ultrasound generator is preferably provided on the platform which supports the vessel. The ultrasound is preferably applied to the beverage when the beverage is being delivered into a vessel and/or after it has been delivered into the vessel.

The platform preferably defines a recess in which the vessel may rest. Where the platform comprises an ultrasound generator, the recess optionally contains a coupling medium which facilitates the transmission of ultrasound to the vessel. The ultrasound coupling medium is generally a gel or water. Gels which facilitate the transmission of ultrasound are known in the ultrasound art.

The nozzle is preferably also arranged to rotate about the same axis as the platform at the same rate as the platform. This is essential where the axis does not pass through a plan surface of the glass. Where the axis does pass through a plan surface of the glass and the nozzle is not arranged to rotate about the axis, the nozzle (preferably the centre of the nozzle) preferably is arranged to lie on the axis.

The vessel may be a drinking vessel, for example a glass.

The draught beverage may be cooled prior to delivering into the vessel, for example using beverage cooling means in a beverage dispensing system which may convey beverage from a supply of beverage to a dispense tap or a font at, for example, a drinks bar. The beverage may be non-alcoholic or alcoholic. For example, an alcoholic beverage may be a beer, for example a lager or an ale, stout or porter or the alcoholic beverage may be cider. The beverage preferably has a water content

and/or a dissolved gas content. The dissolved gas may be nitrogen and/or carbon dioxide.

One advantage of rotating the platform and applying ultrasound to the beverage is that they are believed to promote the formation of ice in the beverage, especially when the beverage is cooled. The combination of the ultrasound with the mechanical shear forces produced in the beverage by the rotating platform provides nucleation sites within the beverage which sites promote the formation of ice. They may also contribute to formation of a head on the beverage. The rate of rotation and/or the power output of the ultrasound generator is/are preferably sufficient to promote the formation of nucleation sites within the beverage. The nucleation sites may be formed by bubbles of gas which had been dissolved in the beverage.

Attention is drawn to two International patent applications, namely International Application No. PCT/GB99/03824 (published under No. WO 01/36582) and International Application No. PCT/GB99/01551 (published under No. WO 99/60092). Any individual feature or any combination of such features of any beverage disclosed in either of those International applications, and any method or apparatus or part of any method or apparatus disclosed in either of those International applications, may be utilised in the dispense of beverage which is the subject of this current application.

Features of the invention will now be further described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a diagrammatic side view of an embodiment of apparatus formed according to the second aspect of the invention for use in performing the method according to the first aspect;

Figure 2 is a diagrammatic side view of another embodiment of apparatus formed according to the second aspect of the invention for use in performing the method according to the first aspect;

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Figure 3 is a diagrammatic side view of an embodiment of apparatus formed according to the fourth aspect of the invention for use in performing the method according to the third aspect;

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Figure 4 is a diagrammatic side view of an embodiment of apparatus formed according to the sixth aspect of the invention for use in performing the method according to the fifth aspect, and

15

Figure 5 is a diagrammatic side view of an embodiment of apparatus formed according to the eighth aspect of the invention for use in performing the method according to the seventh aspect.

20

In the following description with reference to the drawings, the draught beverage can comprise a water content and/or a dissolved gas content which may be carbon dioxide and/or nitrogen. The beverage when subjected to shear may develop nucleation sites in the dispensed beverage at which sites dissolved gas may form gas bubbles. These bubbles may encourage the formation of ice in the beverage particularly if the beverage is cooled before its dispense into a vessel. Also the bubbles may provide a head or increased head on the beverage. The beverage may be non-alcoholic or alcoholic. Examples of draught alcoholic beverages are cider and beer, for example the beer may be a lager.

25

Figure 1 shows an apparatus 1 suitable for filling a drinking vessel in the form of a glass 2 with a draught beverage. The apparatus 1 possesses a beverage delivery or dispense nozzle 3 which is connected to a draught

30

beverage supply line 4. The apparatus further comprises a driven device 5 for shaking the glass 2. The device 5 comprises an arm 6 which securely holds the base of the glass 2 by means of lip 7. The device 5 further comprises a lid 8 which defines a channel 9 through which the
5 beverage may flow from the nozzle 3 into the glass 2. If desired, the channel 9 may be selectively closeable and openable. The lid 8 is provided with a hinge 10 to enable the glass 2 to be inserted into the device 5. The arm 6 is provided with means (not shown) for shaking the glass in such a manner as to induce mechanical shear in the beverage.

10

Figure 2 shows an apparatus 20 suitable for filling the glass 2 with draught beverage using the beverage nozzle 3 connected to the draught beverage supply line 4. The apparatus 20 further comprises means 21 for inducing mechanical shear in the beverage. The means 21 comprises a
15 stirring device 22 which is provided with two paddles 23. The means 21 further comprises motor means 24 which propels the stirring device in such a manner as to induce mechanical shear in the beverage.

If desired, the arm 6 of device 5 (Figure 1) may hold the walls of the
20 glass 2 instead of the base of the glass, or the stirring device 22 (Figure 2) may be provided with only one paddle 23 or more than two paddles which may be of a different shape to that shown.

Figure 3 shows an apparatus 30 suitable for filling the glass 2 with
25 draught beverage using the beverage nozzle 3 connected to the beverage supply line 4. The apparatus 30 further comprises a platform 31 for oscillating the glass 2. The platform 31 comprises a surface 32 on which the base of the glass 2 rests. The platform 31 is provided with motor means 33 which causes the platform 31 to oscillate about an axis 34 which
30 is perpendicular to the surface 32 of the platform 31. Securing means can be provided to detachably secure the glass 2 to the platform 31. The

oscillation of the platform 31 can induce mechanical shear in the beverage in the glass 2. If desired, the platform 31 may be provided with a recessed surface in which recess the glass 2 may sit securely.

- 5 The platform 31 may oscillate through any desired angle, for example an angle of oscillation may be in the range of substantially 5° to substantially 720° .

With reference to Figure 4 there is shown an apparatus 40 suitable for
10 filling the glass 2 with draught beverage using the beverage nozzle 3 connected to the beverage supply line 4. The apparatus 40 further comprises a device 41 for rotating the glass 2. Device 41 comprises an arm 42 which supports a platform 43 on which the glass rests. The device 41 is connected to the beverage nozzle 3 such that the nozzle
15 rotates about the same axis A-A' as the platform 42. The device 41 is provided with driving means 44 which rotates the device about the axis A-A'. Securing means can be provided to detachably secure the glass 2 to the platform 42. The rotation of the platform 43 can induce mechanical shear in the beverage in the glass 2. If desired, the driving means 44 may
20 be arranged to be above the glass 2. Also platform 43 may be arranged to rotate about a central axis thereof parallel to axis A-A'.

With reference to Figure 4, the aforesaid rotation(s) may be continuous or oscillatory.

25

Referring to Figure 5, there is shown an apparatus 50 suitable for filling the glass 2 with draught beverage using the beverage nozzle 3 connected to the draught beverage supply line 4. The apparatus 50 further comprises a rotatable platform 51 which supports the glass 2. Platform
30 51 comprises a lip 52 which forms a recess 53 in which water is present. Platform 51 is rotated by means of a motor 54. The platform 51 is

further provided with an ultrasound generator 55. The water in recess 53 provides an ultrasound coupling to the glass 2. Securing means can be provided to detachably secure the glass 2 to the platform 51.

- 5 The rotation of the platform 51 (which may be about a central vertical axis thereof) together with the effect of the ultrasound on the beverage in the glass 2 can induce mechanical shear in the beverage.

- 10 If desired, recess 53 may contain a gel instead of water. Also motor 52 need not be arranged so that the axis of rotation of the platform 51 is coincident with the centre of the glass 2.

Whilst the ultrasound generator 55 may emit ultrasound at any desired frequency, preferably it is at least substantially 20 kHz.

CLAIMS

1. A method of dispensing a draught beverage, said method comprising delivering a draught beverage into a vessel and inducing
5 mechanical shear in the beverage in the vessel.
2. An apparatus for the delivery of a beverage to a vessel, said apparatus comprising a nozzle for delivery of a beverage which nozzle is adapted to be connectable to a supply of the beverage, and a means for
10 inducing mechanical shear in the beverage when it is present.
3. A method as claimed in Claim 1 or an apparatus as claimed in Claim 2, in which said mechanical shear is induced in the beverage when it is being delivered into the vessel and/or after it has been delivered into
15 the vessel.
4. A method as claimed in Claim 1 or in Claim 3 or an apparatus as claimed in Claim 2 or in Claim 3, in which a stirring device is applied to beverage in the vessel and stirs said beverage thereby inducing said
20 mechanical shear.
5. A method as claimed in Claim 4 or an apparatus as claimed in Claim 4, in which the stirring device is driven.
- 25 6. A method as claimed in Claim 4 or in Claim 5, in which the stirring device comprises at least one blade.
7. A method as claimed in Claim 1 or in Claim 3 or an apparatus as claimed in Claim 2 or in Claim 3, in which the vessel is shaken to induce
30 mechanical shear in the beverage in the vessel.

8. A method as claimed in Claim 7 or an apparatus as claimed in Claim 7, in which vessel shaking means is arranged to hold and shake the vessel.

5 9. A method as claimed in Claim 8 or an apparatus as claimed in Claim 7, in which the vessel shaking means is driven.

10. A method as claimed in Claim 8 or in Claim 9 or an apparatus as claimed in Claim 8 or in Claim 9, in which said vessel shaking means
10 comprises lid means to at least partially cover a top of said vessel.

11. A method of dispensing a draught beverage, said method comprising delivering a draught beverage into a vessel which vessel is supported by a platform wherein the platform oscillates about an axis
15 perpendicular to the surface of the platform on which the vessel is resting.

12. An apparatus for the delivery of a beverage to a vessel, said apparatus comprising a nozzle for delivery of a beverage which nozzle is
20 adapted to be connectable to a supply of the beverage, and a platform for supporting the vessel wherein the platform is provided with means which cause the platform to oscillate about an axis perpendicular to the surface of the platform on which the vessel will rest.

25 13. A method as claimed in Claim 11 or an apparatus as claimed in Claim 12, in which said platform oscillates when the beverage is being delivered into said vessel and/or after the beverage has been delivered into the vessel.

14. A method as claimed in Claim 11 or in Claim 13 or an apparatus as claimed in Claim 12 or in Claim 13, in which motor means is arranged to oscillate the platform.

5 15. A method as claimed in Claim 11 or in Claim 13 or in Claim 14 or an apparatus as claimed in any of Claims 12 to 14, in which the platform oscillates the vessel through an angle of oscillation in the range of substantially 5° to substantially 720° .

10 16. A method as claimed in Claim 11 or in any one of Claims 13 to 15 or an apparatus as claimed in any one of Claims 12 to 15, in which said axis is substantially vertical.

15 17. A method as claimed in Claim 11 or in any one of claims 13 to 16 or an apparatus as claimed in any one of Claims 12 to 16, in which said axis substantially coincides with an axis of the vessel.

20 18. A method of dispensing a draught beverage, said method comprising delivering a draught beverage into a vessel which vessel is supported by a platform wherein the platform rotates about an axis perpendicular to the surface of the platform on which the vessel is resting which axis is not coincident with the centre of the vessel.

25 19. An apparatus for the delivery of a beverage to a vessel, said apparatus comprising a nozzle for delivery of a beverage which nozzle is adapted to be connectable to a supply of the beverage, and a platform for supporting the vessel wherein the platform is provided with means which cause the platform to rotate about an axis perpendicular to the surface of the platform on which the vessel will rest which axis is not coincident
30 with the centre of the vessel.

20. A method as claimed in Claim 18 or an apparatus as claimed in Claim 19, in which the rotation of the platform about said axis is continuous or oscillatory whereby rotation of said vessel about the axis is continuous or oscillatory.

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21. A method as claimed in Claim 18 or in Claim 20 or an apparatus as claimed in Claim 19 or in Claim 20, in which motor means is arranged to rotate the platform.

10 22. A method as claimed in Claim 18 or in Claim 20 or in Claim 21 or an apparatus as claimed in any one of Claims 19 to 21, in which the nozzle rotates about said axis substantially simultaneously with the said platform.

15 23. A method as claimed in Claim 18 or in Claim 20 or in Claim 21 or an apparatus as claimed in any one of Claims 19 to 21, in which said axis passes through the vessel on the platform and said nozzle extends along or lies on the axis.

20 24. A method as claimed in Claim 18 or in any one of Claims 20 to Claims 23 or an apparatus as claimed in any one of Claims 19 to 23, in which said axis is substantially vertical.

25 25. A method as claimed in Claim 18 or in any of Claims 20 to 24 or an apparatus as claimed in any one of Claims 19 to 24, in which said axis is a first axis and said platform is also rotatable about a second axis substantially parallel to the first axis.

30 26. A method as claimed in Claim 25 or an apparatus as claimed in Claim 25, in which said platform is continuously rotatable about the second axis or said platform oscillates about said second axis.

27. A method as claimed in Claim 25 or in Claim 26 or a method as claimed in Claim 25 or in Claim 26, in which said second axis substantially coincides with an axis of said vessel.

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28. A method of dispensing a draught beverage, said method comprising delivering a draught beverage into a vessel which vessel is supported by a platform wherein the platform rotates about an axis perpendicular to the surface of the platform on which the vessel is resting
10 and wherein ultrasound is applied to the beverage.

29. An apparatus for the delivery of a beverage to a vessel, said apparatus comprising a nozzle for delivery of a beverage which nozzle is adapted to be connectable to a supply of the beverage, and a platform for
15 supporting the vessel wherein the platform is provided with means which cause the platform to rotate about an axis perpendicular to the surface of the platform on which the vessel will rest and wherein the apparatus further comprises an ultrasound generator to apply ultrasound to beverage in the vessel when supported by the platform.

20

30. A method as claimed in Claim 28 or an apparatus as claimed in Claim 29, in which said platform rotates when the beverage is being delivered into the vessel and/or after the beverage has been delivered into the vessel.

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31. A method as claimed in Claim 28 or in Claim 30 or an apparatus as claimed in Claim 29 or in Claim 30, in which motor means is arranged to rotate the platform.

32. A method as claimed in Claim 28 or in Claim 30 or in Claim 31 or an apparatus as claimed in any one of Claims 29 to 31, in which the applied ultrasound has a frequency of at least substantially 20 kHz.

5 33. A method as claimed in Claim 28 or in any one of Claims 30 to 32 or an apparatus as claimed in any one of Claims 29 to 32, in which said platform is provided with an ultrasound generator providing said ultrasound.

10 34. A method as claimed in Claim 28 or in any one of Claims 30 to 33 or an apparatus as claimed in any one of Claims 29 to 33, in which said platform has a recess to receive said vessel.

15 35. A method as claimed in Claim 34 or an apparatus as claimed in Claim 34, in which said recess contains or is to receive a liquid or gel ultrasound coupling medium.

20 36. A method as claimed in Claim 28 or in any one of Claims 30 to 35 or an apparatus as claimed in any one of Claim 29 to 35, in which the platform rotates about an axis and said nozzle or a nozzle to deliver the draught beverage into the vessel rotates about the same axis substantially simultaneously with the platform.

25 37. A method as claimed in Claim 28 or in any one of Claims 30 to 35 or an apparatus as claimed in any one of Claims 29 to 35, in which the platform rotates about an axis which passes through the vessel on the platform and said nozzle extends along or lies on the axis.

30 38. A method as claimed in Claim 36 or in Claim 37 or an apparatus as claimed in Claim 36 or in Claim 37, in which said axis is substantially vertical.

39. A method as claimed in Claim 11 or in any one of Claims 13 to 18 or in any one of Claims 20 to 28 or in any one of Claims 30 to 38 or an apparatus as claimed in any one of Claims 12 to 17 or in any one of
5 Claims 19 to 27 or in any one of Claims 29 to 38, in which movement of the beverage in the vessel by said platform induces mechanical shear in the beverage.

40. A method as claimed in Claim 1 or any one of Claims 3 to 10 or in
10 Claim 39 or an apparatus as claimed in any one of Claims 2 to 10 or in Claim 39, in which mechanical shear forces in the beverage in the vessel provide nucleation sites in the beverage.

41. A method as claimed in Claim 40 or an apparatus as claimed in
15 Claim 40, in which said beverage comprises a water content and a dissolved gas content and the occurrence of the nucleation sites promotes the formation of ice in the beverage in the vessel.

42. A method as claimed in Claim 41 or an apparatus as claimed in
20 Claim 41, in which the nucleation sites occur as bubbles of said dissolved gas.

43. A method as claimed in Claim 42 or an apparatus as claimed in
25 Claim 42, in which said bubbles contribute to the formation of a head on the beverage in the vessel.

44. A method as claimed in Claims 41 to 43 or an apparatus as claimed in any one of Claims 41 to 43, in which said dissolved gas content comprises nitrogen and/or carbon dioxide.

45. A method as claimed in any one preceding claim to a method or an apparatus as claimed in any one preceding claim to an apparatus, in which the vessel is a drinking vessel.

5 46. A method as claimed in Claim 45 or an apparatus as claimed in Claim 45, in which the drinking vessel is a glass.

47. A method as claimed in any one preceding claim to a method or an apparatus as claimed in any one preceding claim to an apparatus, in which
10 the draught beverage is non-alcoholic or alcoholic.

48. A method as claimed in Claim 47 or an apparatus as claimed in Claim 47, in which the alcoholic beverage is a beer or cider.

15 49. A method as claimed in Claim 48 or an apparatus as claimed in Claim 48, in which the beer is lager.

50. A method as claimed in any one preceding claim to a method or an apparatus as claimed in any one preceding claim to an apparatus, in which
20 beverage cooling means is used to cool the beverage prior to its delivery into the vessel.

51. A method as claimed in Claim 50 or an apparatus as claimed in Claim 50, in which the beverage cooling means is included in a beverage
25 dispensing system which conveys the draught beverage from a supply thereof to a dispense tap or font.

52. A method as claimed in Claim 51 or an apparatus as claimed in Claim 51, in which the dispense tap or font is in or at a drinks bar.

53. A method of dispensing a draught beverage substantially as hereinbefore described with the reference to Figure 1, or Figure 2, or Figure 3, or Figure 4, or Figure 5 of the accompanying drawings.

5 54. An apparatus for the delivery of a beverage to a vessel substantially as hereinbefore described with reference to Figure 1, or Figure 2, or Figure 3, or Figure 4, or Figure 5 of the accompanying drawings.

10 55. Beverage in a vessel having been dispensed into the vessel by a method as claimed in any one preceding claim to a method or having been delivered into the vessel by an apparatus as claimed in any one preceding claim to an apparatus.



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INVESTOR IN PEOPLE

Application No: GB 0116628.9
Claims searched: 1-6, 40-55

Examiner: Emma Tonner
Date of search: 19 March 2002

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): B8N (NAA, NAB, NJE)

Int Cl (Ed.7): B67D 1/00, 1/04, 1/06, 1/08

Other: Online: EPODOC, PAJ, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2 041 881 A (MILANI) - see whole document	1-5
X	US 5 125 534 (ROSE et al.) - see whole document	1, 3-6

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